

REMARKS

Examiner is thanked for her review of the present application. Claims 1-13 are allowed, and claims 14-18 stand rejected.

No changes have been made to the claims by this amendment. Two (2) new figures, numbers 61 and 62, are attached for the purpose of improving clarity. No new matter is sought to be added to the application. An appendix is located at the end of this amendment purely for the convenience of Examiner.

Favorable reconsideration is respectfully requested.

### **I. Art Objections: All Drawing Objections Are Traversed**

The art objections are all respectfully traversed. As examiner has indicated, Figure 47 does show a reversible valve. This valve is supported by the disclosure and the claims.

Claim 14 reads:

**"A method of operating a drill rig, comprising the step of using downhole circuitry to signal a change in downhole equipment condition by causing a reduction in drilling fluid long-time average pressure."**

This claim is limited by the dependant claim 15:

**"The method of claim 14, wherein said reduction in drilling fluid long-time average pressure is caused by irreversible movement of a valve."**

Figure 47 illustrates a reversible movement of a valve, within the scope of claim 14.

**"...the valve can be designed with a reversible movement from a first state (e.g. closed) to a second state (e.g. open) and back to the first (closed) state."**<sup>1</sup> Newly added drawings 61 and 62 illustrate an irreversible valve consistent with claim 15. These drawings are believed not to add new matter. Support for these drawings is provided by the foregoing sections of the present application, the named claims, as well as within the original specification page 44, lines 10-20, and their entry is respectfully requested.

### **II. Review of the References**

*Scherbatskoy* relates to using hydraulic shock waves for telemetering logging information while drilling is in process.

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<sup>1</sup> Application page 44, line 20-22

*Randall et al.* relates to the transformation of measurement while drilling data acquired during various time intervals into corresponding equal depth intervals. This patent does not appear to disclose or suggest signaling the surface of impending drill bit failure.

**III. The phrase "Long Term Average Pressure" is sufficiently clear to enable one of ordinary skill in the art to make and use the claimed invention without undue experimentation and therefore fulfills the requirements of 35 USC § 112, first paragraph**

With regard to Claims 14-18, Examiner has suggested that it is unclear what is meant by the phrase "long term average pressure." The phrase "long term average pressure" is a generally accepted term of art. Examiner uses this term of art in her office action dated September 23, 2004:

*"Scherbatskoy discloses a method of operating a drill rig comprising using downhole circuitry to signal a change in downhole sensors by causing a reduction in drilling fluid long time average pressure (see col. 6, lines 14-20)."*<sup>2</sup>

The test for compliance with the enablement requirement is whether the specification is sufficient to enable one skilled in the art to make and use the claimed invention without undue experimentation. *U.S. v. Telectronics, Inc.*, 857 F.2d 778, 785, 8, U.S.P.Q.2d 1217, 1223 (Fed. Cir. 1988); *Ex parte Rodgers*, 27 U.S.P.Q.2d 1738, 1743 n. 10 (Bd. Pat. App. 1992). While not explicitly used, there is sufficient support for this phrase found in the specification. For instance, the specification notes that "a sleeve valve can be opened and closed repeatedly to cause corresponding low and high pressure

<sup>2</sup> Page 3, last paragraph of Office Action dated September 23, 2004 (emphasis added).

pumping levels at the surface.”<sup>3</sup> Although this sentence doesn’t use the exact words, “long term average pressure”, the effect would be to decrease the long term average pressure. Therefore, the 112 requirement is satisfied. Additional support for this use of pressure is found throughout the present application.<sup>4</sup> Therefore, the written description requirement of 112 has been fulfilled.

Moreover, this phrase is used commonly in reference to the prior art, and therefore the use of the term in the claimed invention should be construed as clear enough to enable one who is skilled in the art to understand what is meant. If, however, Examiner still harbors any doubts as to the sufficiency of the disclosure, applicants will submit an affidavit from one of ordinary skill in the art to overcome the objection and rejection based on Section 112, first paragraph.

As all grounds for this rejection have been traversed and/or obviated, Applicants respectfully request withdrawal of this rejection.

**IV. Scherbatskoy does not anticipate “a method of operating a drill rig, comprising the step of using downhole circuitry to signal a change in downhole equipment condition by causing a reduction in drilling fluid long-time average pressure” under 35 USC § 102(b)**

Claims 14, 16-17 stand rejected under 35 USC Section 102(b) as anticipated by *Scherbatskoy*.

<sup>3</sup> Application page 41, line 1-3.

<sup>4</sup> Application page 3, lines 23-38; page 19, lines 6-10; page 19, lines 19-26; page 41, lines 11-18; and page 46, lines 23-29.

**A. Scherbatskoy is directed towards the monitoring of bore conditions rather than equipment conditions.**

Claims 14 stands rejected under 35 USC Section 102(b) as anticipated by *Scherbatskoy*. This rejection is based upon the following section of *Scherbatskoy*:

*"The valve, in accordance with my invention, is operated by the output of one or more sensors for sensing one or more downhole parameters in the earth's subsurface near the drill bit."*<sup>5</sup>

This section does not anticipate "a method of operating a drill rig, comprising the step of using downhole circuitry to signal a change in downhole equipment condition by causing a reduction in drilling fluid long-time average pressure."<sup>6</sup> The *Scherbatskoy* reference is designed to monitor downhole bore conditions while the claimed invention is designed to monitor drilling equipment.

**B. Scherbatskoy relates to using hydraulic shock waves for telemetering bore data while the claimed invention uses "downhole circuitry to signal a change in downhole equipment condition."**

*Scherbatskoy* relates to using hydraulic shock waves for telemetering logging information about the bore while drilling is in process, and uses valve movement to signal a change in bore conditions.

*"Rapid or almost instantaneous openings and closings of the valve have an important and far reaching influence on the performance of a telemetering system in a measuring while drilling operation."*<sup>7</sup>

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<sup>5</sup> *Emphasis added.*

<sup>6</sup> Claim 14, *Emphasis added.*

<sup>7</sup> Col. 4, ll. 60-67 (emphasis added by Applicants).

This passage teaches shockwaves, and does not mention pressure changes or measure pressure changes and therefore it does not teach or suggest the invention as disclosed in claim 14. Therefore, signaling downhole conditions by simply causing a reduction in drilling fluid long-time average pressure is not the same as using hydraulic shock waves for telemetering logging information. Therefore, a prima facie case of anticipation has not been established by the Examiner with regard to Claim 14.

The present application also expressly distinguishes between this art and the present inventions:

**"This type of transmission is different that standard mud-pulse technology which is used in MWD systems. The difference lies in the fact that static pump pressure levels are monitored rather than transient acoustic pressure pulses. This type of transmission will be much slower than mud-pulse telemetry systems, but is suitable for low tech, low cost settings where complex and expensive surface receivers are not economically practical."**<sup>8</sup>

Furthermore, *Scherbatskoy* does not teach, suggest, or give any incentive to make the needed changes to reach the presently claimed invention. *Scherbatskoy* actually teaches away from the presently claimed invention because it teaches a method of gathering information about the bore opposed to **"using downhole circuitry to signal a change in downhole equipment condition"** as in the presently claimed invention. Please take note that this argument is separate from the argument regarding the signaling technique previously discussed. One of ordinary skill in art would not be led to modify *Scherbatskoy*

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<sup>8</sup> Page 41 line 28 – page 42 line 6.

to reach the present invention when the reference is examined as a whole. Absent some teaching, suggestion, or incentive to modify *Scherbatskoy* in this manner, the presently claimed invention can be reached only through an improper use of hindsight using the applicants' disclosure as a template to make the necessary changes to reach the claimed invention.

**C. Scherbatskoy discloses a pressure variation caused by cycling a valve for telemetry purposes, and not the "method of claim 14, wherein said reduction in drilling fluid long-time average pressure is caused by irreversible movement of a valve."**

Claim 16 of the present application stands rejected based upon *Scherbatskoy*. Examiner argues that the present invention is taught or suggested because "Scherbatskoy discloses downhole sensors." First, since claim 16 depends from claim 14, the same distinctions between *Scherbatskoy* and the claimed invention in claim 14 for these claims. Additionally, claim 16 claims other additional combinations of features not suggested by the reference, specifically the use of the sensors to measure the downhole equipment conditions. Consequently, it is respectfully urged that the rejection of claims 16 has been overcome.

**D. Scherbatskoy discloses downhole sensors to measure bore conditions, not sensors capable of measuring downhole equipment conditions.**

Claim 17 of the present application stands rejected based upon *Scherbatskoy*. Examiner argues that the present invention is barred because "Scherbatskoy discloses downhole sensors." First, since claim 17 depends from claim 14, the same distinctions between *Scherbatskoy* and the claimed invention in claim 14 for these claims. Additionally, claims 14 claim other additional combinations of features not suggested by the reference,

specifically the use of the sensors to measure the downhole equipment conditions. Consequently, it is respectfully urged that the rejection of claims 17 has been overcome.

**V. The combination of Randall and Scherbatskoy do not render the "adaptive filter which analyzes data from sensors located on the drill string" in the claimed invention obvious under 35 USC § 103(a)**

Claim 18 stands rejected under 35 USC § 103(a) as unpatentable over Scherbatskoy in view of Randall et al.

**A. The cited prior art actually teaches away from the claimed invention.**

Scherbatskoy actually teaches away from the presently claimed invention since Scherbatskoy directs one to monitor bore conditions rather than monitor for equipment failure as in the claimed invention. See *In re Hedges*, 228 U.S.P.Q. 685 (Fed. Cir. 1986). Thus, one of ordinary skill in the art would not be motivated to make the changes proposed by the examiner.

"It is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art." *In re Hedges*, 228 U.S.P.Q. at 687. Thus, when Scherbatskoy is examined as a whole, teaches away from "the method of claim 14, wherein said change in downhole equipment condition is determined by an adaptive filter which analyzes data from sensors located on the drill string" as recited in claim 18. Therefore, one of ordinary skill in the art would not be motivated to make the examiner's proposed changes.



**B. Neither Randall nor Scherbatskoy teach the problem of downhole bit failure.**

The present invention recognizes the problems of bit failure.

**"The problem of downhole bit failure can be broken down into two parts. The first part of the problem is to develop a failure detecting method and the second part of the problem is to develop a method to warn the operator at the surface."**<sup>9</sup>

Randall and Scherbatskoy do not teach the problem or its source. Instead, Scherbatskoy and Randall are both directed towards gathering data about the bore conditions as opposed to the condition of the equipment.

**C. Even if the references could be properly combined, the combination of the references would not form the presently claimed invention.**

The present invention is directed towards the method of claim 14, wherein said change in downhole equipment condition is determined by an adaptive filter which analyzes data from sensors located on the drill string. Even if Randall and Scherbatskoy could be properly combined, a combination of Randall and Scherbatskoy would not form the presently claimed invention in claim 18. Instead, a combination of Randall and Scherbatskoy would result in an instrument directed at gathering information about the condition of the bore, not monitoring the condition of the drilling equipment.

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<sup>9</sup> Application page 2, lines 19-22.

**VI. Conclusion**

Thus, all grounds of rejection and/or objection are traversed or accommodated, and favorable reconsideration and allowance are respectfully requested. The Examiner is requested to telephone the Elizabeth Pham or Patrick Holmes for an interview to resolve any remaining issues.

Respectfully submitted,



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